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ART. 17. A NEW GEOMYID RODENT FROM THE  
MIOCENE OF MONTANA

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Recently, Dr. J. LeRoy Kay of the Carnegie Museum sent me a rodent jaw from the Miocene of Montana for identification. This specimen represents a member of the Entoptychinae, the dominant Lower Miocene subfamily of the Geomyidae or pocket gophers. The specimen indicates that this represents a member of the group which differs from all hitherto described specimens sufficiently to warrant its being established as a new species.

I wish to express my deep appreciation to Dr. Kay for permitting me to describe this specimen. This study was assisted by a grant from the Marsh Fund of the National Academy of Sciences.

**Gregorymys kayi**, sp. nov.

*Holotype*: Carnegie Museum No. 8,999, left lower jaw with incisor and P<sub>4</sub>-M<sub>3</sub>.

*Horizon and Locality*: Miocene, Six Mile Creek, 5 miles west of Toston, Montana, field no. 22<sub>48</sub>, collected by J. LeRoy Kay, 1948.

*Diagnosis*: Similar to *G. douglassi*, but apparently smaller; much greater development of cement around the roots, extending well up the sides of the crown, more than in *G. douglassi* or *G. montanensis*; enamel greatly thinned or even absent on anterior faces of molars; roots present.

This species differs from the other members of the genus\* in the very extensive development of cement. This not only covers the roots, but extends up the sides of the crown to levels well above the bottom of the pattern. The enamel is thinned on the anterior side of the teeth much more than is the case in other species of the genus, though it does not appear

\*Wood, Albert E. 1936. Geomyid rodents from the middle Tertiary. *American Museum Novitates*, no. 866, 31 pp., 33 figs.

Hibbard, Claude W., and Kendall A. Keenmon. 1950. New evidence of the Lower Miocene Age of the Blacktail Deer Creek Formation in Montana. *Contrib. Mus. Paleont., Univ. Michigan*, vol. 8, no. 7, pp. 193-204, 3 figs., 1 map. According to a letter from Dr. Hibbard, dated November 21, 1950, there is no cement on the sides of the crowns of *G. montanensis*, even well down in the alveoli.



to be interrupted at the stage of wear represented by the specimen. However it seems probable that at a somewhat more advanced stage of wear the enamel would be interrupted, thus coming within the definition of *Entoptychus* as given by Wood (1936). However, the fact that roots are clearly present, and that the crowns are not exceptionally high, justifies the inclusion of this form in *Gregorymys*. The cement extends as a thin layer along the anterior face of the molars, although interdental wear removes it very largely.

In all the molars, the central valley has been transformed into a crescentic lake, with its concave side directed anterad (fig. 1 b). No trace of separate cusps seems to be visible in the molars.  $M_1$  is the largest of the molars, and  $M_3$  is the smallest.

In the premolar, the central valley has the same shape as in the molars, but opens broadly along the lingual side. There is, however, a lingual dam some distance down the side of the crown, so that the valley would eventually be transformed into the same lake as is seen in the molars. In the talonid, there is no trace of details of the pattern. In the trigonid, however, there are faint irregularities in the enamel outline, suggesting the last traces of cusps. At the antero-lingual corner there is a marked valley, extending only a short distance below the wear surface, which appears to represent the last remnants of a valley behind the anteroconid. That is, as in other species of *Gregorymys*, the trigonid of  $P_4$  must have had a well developed group of accessory cusps. The premolar is the largest of the teeth.

The incisor has a broad, flat anterior face, with the enamel only just reaching the median and lateral surfaces (fig. 1 a). The tooth is a broad and very efficient cutting tool. A peculiarity, presumably of this individual, is the narrowing of the incisor from both ends, so that it is distinctly more slender at a point just inside the alveolus than it is either nearer the tip of the tooth or nearer the root (see measurements). The extra-alveolar enamel is orange-brown in color.

The jaw is not exceptionally heavy for a geomyid. The ventral border of the masseteric crest extends nearly straight laterad, below the cheek teeth, and runs nearly horizontally (fig. 1 c). The ascending ramus rises steeply by the middle of  $M_2$ . The diastema is short and deeply notched. The mental foramen lies beneath the deepest point of this notch, just ventrad of the anterior end of the masseteric fossa. The symphysis is at a sharp angle with the horizontal ramus, so that, viewed from above, the two jaws must have diverged markedly. It is also heavily pitted and cor-



rugated, showing that there was no motion between the mandibles, a fact in accord with the structure of the incisor. Just below the main part of the symphysis is a deep pit. The angle is reduced but is markedly inverted, being of the general entoptychine type, in contradistinction to *Thomomys* and *Geomys* where the angle is non-existent.

This form is obviously similar to *Gregormys curtus*, *G. montanensis*, and *G. douglassi*, the last two also coming from Montana. Although *G.*

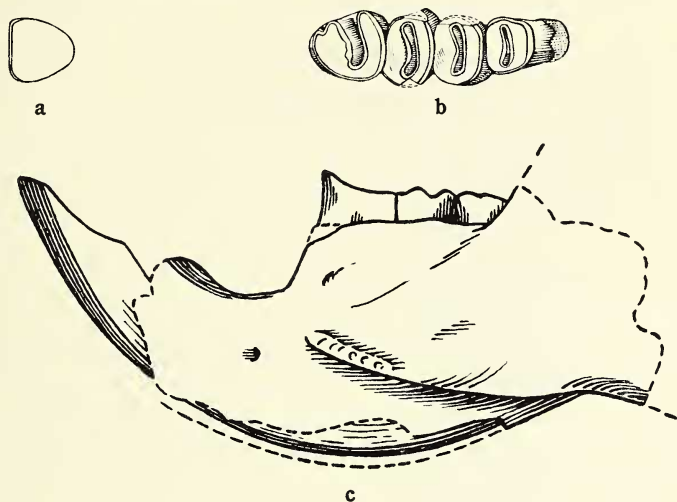


FIG. 1. *Gregormys kayi*, Carnegie Museum No. 8,999.

All figures,  $\times 4$ .

- a. Incisor<sub>1</sub> left, view of anterior face.
- b. P<sub>4</sub>—M<sub>3</sub> left.
- c. Lateral view of lower jaw.

*douglassi* is known only from a skull, the present form is clearly too large to belong with that skull. A more important difference lies in the great expanse of the cement in *G. kayi*, which would seem to be a progressive character. The sequence *G. curtus*—*G. douglassi*—*G. kayi* seems to represent a structural line of rather uniform morphology but with gradually increasing amounts of cement and with a gradual approach toward the condition found in *Entoptychus*. *G. montanensis* would represent a related side-branch in which the amount of cement had been secondarily reduced, but which otherwise was very close to *G. kayi*.

*G. kayi* seems to represent a culmination of the *Gregormys* evolutionary



line, being somewhat the most specialized member of the genus. In its specializations, it shows a number of features characteristic of the related genus *Entoptychus*. These, however, certainly represent parallelisms within the *Gregorymys* line to the trends within the contemporary *Entoptychus*, where *Entoptychus*, at any given period, is structurally more advanced than the members of *Gregorymys*, just as the entoptychines as a whole parallel but are more advanced than the contemporary heteromyids.

Measurements of *Gregorymys kayi*

(Carnegie Museum No. 8,999)

|                                  |                                  |              |
|----------------------------------|----------------------------------|--------------|
| P <sub>4</sub> —M <sub>3</sub> , | alveolar distance                | 7.80 mm.     |
|                                  | crown surface                    | 6.90         |
| P <sub>4</sub>                   | antero-posterior                 | 2.37         |
|                                  | width trigonid                   | 1.80         |
|                                  | width talonid                    | 2.24         |
| M <sub>1</sub>                   | antero-posterior                 | 1.53         |
|                                  | width trigonid                   | 2.26         |
|                                  | width talonid                    | ca. 2.30     |
| M <sub>2</sub>                   | antero-posterior                 | 1.60         |
|                                  | width trigonid                   | over 2.05    |
|                                  | width talonid                    | over 2.00    |
| M <sub>3</sub>                   | antero-posterior                 | 1.58 (crown) |
|                                  | width trigonid                   | 1.83         |
|                                  | width talonid                    | 1.67         |
| I <sub>1</sub>                   | antero-posterior                 | 2.06         |
|                                  | transverse, at tip               | 2.04         |
|                                  | transverse, just inside alveolus | 1.96         |
|                                  | transverse, beneath cheek teeth  | 2.05         |



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ART. 18. THE MAMMALS OF THE MAZINAW LAKE REGION  
OF ONTARIO; THEIR REPRODUCTION AND  
POPULATION DYNAMICS\*

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I. INTRODUCTION

The mammals of the Mazinaw Lake region of southern Ontario were investigated during the first two weeks of July, 1949, and July, 1950. The following is a report on these investigations.

The region lies in the Canadian Precambrian shield section of Lennox and Addington Counties, Ontario. The particular area covered in this account is a north and south strip about twenty-five miles long following highway 41. The west shore of Mazinaw Lake forms the middle of this strip. The lake itself is seven miles long and from one-half to three miles wide, and is one of the larger lakes in the region. All trap locations were within a mile and a quarter from the highway.

The general elevation varies from 850 to 1,250 feet, rising continuously to the northwest to the Algonquin Park area about sixty miles away. The region falls away to the south to meet the great lakes plains, and to the north to meet the Ottawa River valley. The whole region is rolling and rocky with numerous extensive outcrops and bare spots resulting from extensive glaciation. Lakes are numerous, and the general altitude of the low areas is so nearly the same that the drainage from lake to lake flows down only a slight gradient, resulting in slow-flowing, sluggish streams. These traverse numerous boggy areas, and recent lake or pond fills are numerous. The poorly drained, low areas possess a rich acid soil, while the hillsides and uplands are relatively dry and rocky with a thin, sandy, subacid soil. The hillsides are drained by numerous, small, rocky streams which rapidly go dry under drought conditions. Springs are scarce.

Along the eastern shore of Mazinaw Lake, and extending considerably north and south, is a relatively recent fault reaching a height of 1,450 feet from the lake bottom to its highest point. This is responsible for a series of north and south lakes and bogs, and for forming the main drainage of the Mazinaw region.

Halliday (1937) puts this area in the Algonquin-Laurentides section of

\*The mammal specimens upon which this paper is based are deposited in Carnegie Museum.





the Great Lakes-St. Lawrence forest region, which he characterizes as follows: ". . . the bed-rock is part of the great Precambrian Shield of Canada, and consists largely of crystalline limestones (Grenville series), schists, and gneisses of the altered sedimentaries and granite intrusives. The topography is rough and irregular, and glacial deposits of varied character, chiefly of somewhat light texture, cover the greater part. In addition there are some lacustrine deposits from the Nipissing-Great Lakes and Algonquin periods. A podsol type of soil is to be expected, but areas of gray-brown and brown forest soils may be present.

"In this section, white pine probably reached its maximum development in Canada, but extensive lumbering and fire have removed the greater part. Red pine has also been a prominent species, especially on the Algonquin Highlands. In spite of the previous dominance of these species and the presence of intrusive conifers from the boreal forest region, the general character is that of a mixed forest, and the dominant or competitive association is one of sugar maple, yellow birch, hemlock, and white pine. In addition there are varying amounts of basswood, white spruce, balsam fir, beech, (Northern) red oak, elm, white ash, red maple, ironwood, white birch and large-toothed aspen. The composition of this association changes somewhat to the north, as hemlock, (Northern) red oak, and beech decrease numerically and finally drop out before the limits of the Section are reached and the proportion of yellow birch, white spruce, balsam fir, and white birch increases. . . . Throughout the Section, areas of hardwood occur on the ridge tops and on heavier soil deposits, and black spruce, tamarack, and some cedar are found in swampy depressions."

The Mazinaw region fits into Halliday's description for the more northern limits of the Algonquin-Laurentides Section, probably as a result of its altitude. Beech and hemlock are scarce, and the northern red oak is confined to the drier areas. The uplands support a hardwood forest with sugar maple dominant. Cut-over areas have grown up to aspen (both large-toothed and trembling), white birch, red maple, red oak, and some white spruce and fir. Pure conifer stands of white spruce and fir occupy the lower dry areas, while extensive black spruce and tamarack bogs abound. These latter, when cut over, come up in alder and willow. Black ash-white cedar bogs are abundant. About seven miles to the west of Mazinaw Lake there is still a large stand of virgin white pine surrounding Weslemkoon Lake. This stand, in which pines four feet d.b.h. are reportedly common, is being lumbered around its edges at the present time, but only in winter when the logs can be skidded out. Besides these forest



types, there are numerous high "balds" of bare rock alternating with extensive areas of blueberries.

Extensive timbering occurred sixty years ago and the area has been burned over two or three times since, the last fire having taken place about twenty years ago. It is evident at present that white pine will again be the climax forest type, as even now they are beginning to crowd out the aspens and birches on the hillside areas. Pine seedlings of all sizes abound.

A small area of each general forest type was selected for trapping, and as far as possible these areas were chosen so that they were in a continuous habitat of the same type. The following habitats were trapped in, and further discussions of the vegetation will appear under the heading describing the specific area.

I. Dry, rocky, mixed deciduous-conifer woods: deciduous vegetation dominant.

II. Low, wet, deciduous woods with a few patches of conifers, and boggy areas.

III. Black ash-northern white cedar bog.

IV. Dry old field. *Danthonia* dominant.

V. Open *Vaccinium*-sphagnum bog surrounded by spruce and tamarack.

VI. Dominantly deciduous woods with alder bogs and small open sedge bogs.

VII. Small sphagnum-spruce-fir bog in a more extensive mixed woods.

VIII. Open, sedge marsh.

IX. High blueberry bog.

X. Pure, dense, black spruce bog; white spruce and fir on surrounding drier areas.

The climate of the area is classified by Halliday (1937) as temperate and humid plus, with moisture abundant at all seasons. Thirty inches of snow is seldom exceeded at any time. The lowest temperature so far recorded at Mazinaw Lake is 52° below zero F., but ordinarily winter temperatures do not go below -20°F. In 1949, however, drought conditions prevailed for two months from the end of April until the end of the first week in July, with the final forty days without any rain whatsoever. Bogs were for the most part without standing water, and most streams were either totally dry or with only a slight trickle. More normal conditions of precipitation prevailed in 1950, and during the first two weeks of July there was from a foot to eighteen inches of water standing in the bogs which had been dry the previous year.



In 1950 a much colder spring and a later summer prevailed than in 1949. This difference was reflected in the plants. In 1949 the hot, dry spring was from two to three weeks ahead of the colder, wet spring of 1950. Blueberries and *Aralia* berries were ripe by July 1, 1949, but were just beginning to ripen by July 14, 1950, and this difference was true of many other blooms and fruits.

The small mammals were trapped with regular snap-back traps. The bait used was either pure ham-fat rubbed on the trap, or a mixture of ham-fat, peanut butter, and almond extract. Smears of the testis and epididymis were made of each male and were stained with haematoxylin-eosin (Christian, 1950a). The reproductive tracts of the females were preserved entire.

The fur-bearers and large animals were not trapped, although a few in good condition were picked up from the highway. Information regarding these mammals was, for the most part, obtained by questioning local trappers, and residents, and others who were familiar with the local mammals. Most of this information was obtained from Albert Spencer and Irving Brown, both reliable and experienced trappers in the area, and from Fred Garbutt, an interested and observant local resident.

The following account has been divided into four sections: the habitats trapped in, accounts by species, discussion of populations, and information on reproduction and its relation to population dynamics.

## II. DISCUSSION OF SPECIFIC HABITATS

Ten habitats were chosen for trapping as being representative of the region, and these are discussed in detail below. All references to habitats following the discussion of a mammal refer to the designating numeral of the specific habitat area.

I. *The dry, rocky, steep hillside of the west shore of Mazinaw Lake, seven miles north of Cloyne, Ontario. Elevation 900 feet. Trapped in 1949 and 1950.*

This area is the dry hillside comprising the west shore of Mazinaw Lake, which is completely wooded except for a few old cleared areas. The forest is primarily deciduous and is composed of sugar maple, aspen, white birch, and some white and red pines. Numerous bare boulders and outcrops of quartzite are scattered through the area providing many cracks and crevices in which small mammals may take refuge. The hillside is well drained. The sandy, thin, and subacid soil has been formed by the breakdown of metamorphosed sandstones. Wild sarsaparilla, wintergreen, bush



honeysuckle, and low sweet blueberry form the principal ground cover. The area was burned and lumbered in the past and now represents a maturing second growth.

The difference in seasons between similar dates in 1949 and 1950 is plainly shown by the various flowering plants. Bunchberry was in berry in 1949, while at the same time in 1950 it was only in full bloom, even in warm, open spots. *Aralia* berries were ripe in 1949, but the plant was just past blooming in 1950. The bush honeysuckle was well past blooming in 1949, but was in full bloom in 1950. Blueberries were ripe the first of July in 1949, but were only beginning to ripen at the end of the second week of July in 1950.

The following is a list of the principal plants of the area. The more dominant forms are preceded by an asterisk in this and all following lists of flora. More than one asterisk indicates that the form is dominant almost to the exclusion of others.

- White pine (*Pinus strobus*)
- Red pine (*Pinus resinosa*)
- Balsam fir (*Abies balsamea*)
- Hemlock (*Tsuga canadensis*)
- \*Trembling aspen (*Populus tremuloides*)
- \*Large-toothed aspen (*Populus grandidentata*)
- \*White birch (*Betula papyrifera*)
- Red oak (*Quercus borealis*)
- \*Sugar maple (*Acer saccharum*)
- Red maple (*Acer rubrum*)
- \*Smooth-leaved shadbush (*Amelanchier laevis*)
- Moosewood (*Acer pensylvanicum*)
- \*Bunchberry (*Cornus canadensis*)—berry, 1949; bloom, 1950.
- \*Low sweet blueberries (*Vaccinium pennsylvanicum*)—berry, 1949.
- \*Bush honeysuckle (*Diervilla lonicera*)—Bloom, 1950.
- \*Wintergreen (*Gaultheria procumbens*)
- Running ground pine (*Lycopodium complanatum*)
- Running clubmoss (*Lycopodium clavatum*)
- Rock polypody (*Polypodium virginianum*)
- Bracken (*Pteridium latiusculum*)
- \*Heartleaf lily (*Maianthemum canadense*)—just past bloom, 1950.
- \*Fireweed (*Epilobium augustifolium*)—in bloom, 1949 and 1950.
- \*\*Wild sarsaparilla (*Aralia nudicaulis*)—berries ripe, 1949.
- Green pipsissewa (*Chimaphila umbellata*)



A list of the birds found in the area follows. Both the yellow-bellied sapsucker and the least flycatcher were known to be nesting in the immediate area, while the others, if not nesting in the immediate area, were nesting in the vicinity.

Spotted sandpiper (*Actitis macularia*)

Ring-billed gull (*Larus delawarensis*)

Whip-poor-will (*Antrostomus vociferus*)

Kingfisher (*Megaceryle alcyon*)

Ruby-throated hummingbird (*Archilochus colubris*)

Flicker (*Colaptes auratus*)

\*Yellow-bellied sapsucker (*Sphyrapicus varius*)

Crested flycatcher (*Myiarchus crinitus*)—abundant 1949, scarce 1950.

\*Least flycatcher (*Empidonax minimus*)

Robin (*Turdus migratorius*)—abundant 1949, less so 1950.

Veery (*Hylocichla fuscescens*)

\*Cedar waxwing (*Bombycilla cedrorum*)

\*\*Red-eyed vireo (*Vireo olivaceus*)

Magnolia warbler (*Dendroica magnolia*)—1950 only; immature.

Myrtle warbler (*Dendroica coronata*)

Pine warbler (*Dendroica pinus*)—1949 only.

Oven-bird (*Seiurus aurocapillus*)

Purple finch (*Carpodacus purpureus*)

Goldfinch (*Spinus tristis*)

\*Chipping sparrow (*Spizella passerina*)

Song sparrow (*Melospiza melodia*)

One blue-tailed skink (*Eumeces fasciatus*) was collected from among the rocks at the lake-edge in this habitat.

*Mammals:* Since the area is relatively dry, there is a large chipmunk population in and around the rocks. Skunks are common, probably attracted by the garbage from the few cottages in the area. One half-grown and one very emaciated adult female were collected. Another young *Mephitis*, a litter mate of the one collected, was also known to be in the area, and possibly others were present. Red squirrels were at one time abundant, but have been completely "shot out." At least one mink is known to have been in the area. Porcupines have wandered in and out, but are shot on sight. One young racoon was found dead, apparently a highway casualty, as the animal was entire, including its pelt.

In 1949, eighteen traps were set in the area in places looking suitable for small mammals, such as rock crevices, along fallen logs, and at the



bases of rocks. These remained for three nights, during which time one *Peromyscus maniculatus gracilis*, three *Peromyscus leucopus noveboracensis*, and two *Blarina brevicauda talpoides* were captured, making nine trap-nights, per catch.

In 1950, no mouse traps were set, but five rat traps were placed in likely spots for chipmunks. None was caught, but one *Blarina* fell victim. Later the traps were moved and baited with bacon rind for flying squirrels. These traps caught one juvenile *Peromyscus maniculatus gracilis* the first night and two nights later took a half-grown *Mephitis*.

## TRAPPING SUMMARY—1949

| Date: July                          | 3 | 4 | 5 | Total |
|-------------------------------------|---|---|---|-------|
| <i>Peromyscus m. gracilis</i>       | 0 | 0 | 1 | 1     |
| <i>Peromyscus l. noveboracensis</i> | 1 | 1 | 1 | 3     |
| <i>Blarina b. talpoides</i>         | 1 | 1 | 0 | 2     |
| Total                               | 2 | 2 | 2 | 6     |

6 catches in 54 trap-nights, or 1/9 trap-nights.

Summary 1950: 50 trap-nights (rat traps)—3 catches or 1/17 trap-nights.

II. A damp, second-growth, deciduous woods along Bon Echo Creek, five and one-half miles north of Cloyne, Ontario. Elevation 900 feet. Trapped in only in 1949.

Bon Echo Creek flows from Bon Echo Lake to Mazinaw Lake, where it empties on the west shore. The gradient from Bon Echo to Mazinaw is slight, resulting in the creek being a slow-flowing stream traversing a poorly drained area with many bogs. The soil is rich, black, and acid, and the creek is stained dark from this acid bog soil through which it flows. The surrounding forest is composed primarily of second-growth deciduous trees with some firs, and patches of white and black spruces in the drier and wetter areas respectively. An occasional white pine still stands. Most of the growth has developed since the area was burned over about twenty years ago. A road passes through the area, and ends at an abandoned lumber camp at the east end of Bon Echo Lake. The undercover is very dense with a large percentage of alder, aspen, and white birch saplings.

A list of the dominant vegetation follows.

White pine (*Pinus strobus*)

White spruce (*Picea glauca*)

\*Black spruce (*Picea mariana*)

\*Balsam fir (*Abies balsamea*)

\*Large-toothed aspen (*Populus grandidentata*)

\*Trembling aspen (*Populus tremuloides*)



Yellow birch (*Betula lutea*)  
 \*White birch (*Betula papyrifera*)  
 \*Speckled alder (*Alnus incana*)  
 White elm (*Ulmus americana*)  
 Moosewood (*Acer pennsylvanicum*)  
 \*Sugar maple (*Acer saccharum*)  
 \*Red maple (*Acer rubrum*)  
 Sensitive fern (*Onoclea sensibilis*)  
 Thin-leaved pyrola (*Pyrola elliptica*)

This habitat is of a more southern type than any of the others trapped, and approaches the transition (upper austral) zone in character.

The birds noted in the area are:

Ruffed grouse (*Bonasa umbellus*)—covey of 6 young.  
 Woodcock (*Philohela minor*)  
 Hummingbird (*Archilochus colubris*)  
 Crested flycatcher (*Myiarchus crinitus*)  
 Phoebe (*Sayornis phoebe*)  
 Robins (*Turdus migratorius*)

*Mammals:* Deer tracks were seen along the old dirt road. Every time the area was visited a *Lepus americanus*, apparently the same one, was seen alongside the road in approximately the same spot. On every occasion I was able to approach within a few feet of this animal without unduly alarming it.

Forty-nine traps were set in the area with thirty-three through the moist woodland and along the stream in likely looking spots. An especially promising site for voles was a rocky portion of a grass-grown, abandoned road. Seven traps were set in a small, bog area with black spruce saplings and alders growing in a wet black soil, and nine in a dry patch of white spruces. These traps were left set for only two nights.

Two *Peromyscus maniculatus gracilis*, one *Peromyscus leucopus noveboracensis*, and four *Blarina* were caught in this area. One *Microtus pennsylvanicus* was caught in the grassy spot mentioned above, but was eaten, apparently by a shrew, and could not be saved as a specimen. A total of eight mammals caught meant 1 catch per 12.25 trap-nights.

#### TRAPPING SUMMARY—1949

| Date: July                          | 3 | 4 | Total |
|-------------------------------------|---|---|-------|
| <i>Peromyscus m. gracilis</i>       | 2 | 0 | 2     |
| <i>Peromyscus l. noveboracensis</i> | 1 | 0 | 1     |
| <i>Blarina b. talpoides</i>         | 2 | 2 | 4     |
| <i>Microtus p. pennsylvanicus</i>   | 1 | 0 | 1     |
| Total                               | 6 | 2 | 8     |



III. *A dense, cool, black ash-northern white cedar bog, five and one-half miles south of Denbigh, Ontario. Elevation 950 feet. Trapped in 1949 and 1950.*

A typical, dense, cool, northern white cedar-black ash bog, which has apparently been by-passed by recent-past fires or lumbering operations. The actual bog area is approximately fifty yards wide and extends north and south about a half-mile, draining into a small mill pond at the south. The bog is criss-crossed with fallen white cedar logs, subdividing the area into a series of small, disconnected "boglets." These vary from a few feet in each dimension up to about twenty by fifty feet. The black, acid, mucky soil supports a dense growth of sphagnum which continues on, with other mosses, over fallen logs, stumps, and hummocks. Liverworts and *Selaginella* were also included with the mosses. In 1949, there was no standing water in the bog except in the center of one very large boglet, where there were a few inches. The area remained wet, however, in spite of the lack of standing water. In 1950, there were between twelve and eighteen inches of water throughout the bog, and this was added to in the first week of July by the almost daily rains. The hills forming the east and west boundaries of the bog were covered chiefly with white and black spruces and firs. Black spruces and firs also occurred in the bog, but were not among the dominant forms. The full grown, standing, white cedars, and the great majority of the cedars were of this type, averaged a foot *d.b.h.*, while the fallen trunks of these trees were of this size or larger. The relatively uniform size of the standing cedars probably indicates the growth since some past lumbering operations or fires. The surrounding spruces were mature trees in the neighborhood of fifty or sixty feet tall.

The bog abutted abruptly against a low, fault scarp on the east. This scarp varied from a few to over thirty feet in height. Under the sphagnum-covered talus at its base was a continuous "tunnel-run" which produced the usual high catches of an "edge" habitat. This scarp appears to be a northward continuation of that forming the eastern shore of Mazinaw Lake, and is at the northern end of a continuous valley containing a series of bogs and small and large lakes. It is also the center of drainage for the immediately surrounding area.

A list of the major plant forms follows:

\*White spruce (*Picea glauca*)—adjoining dry areas.

\*Black spruce (*Picea mariana*)

\*Balsam fir (*Abies balsamea*)

\*\*Northern white cedar (*Thuja occidentalis*)



Trembling aspen (*Populus tremuloides*)  
White birch (*Betula papyrifera*)  
Speckled alder (*Alnus incana*)  
White elm (*Ulmus americana*)  
Moosewood (*Acer pennsylvanicum*)  
Black alder (*Ilex bronxensis*)  
Alder-leaved buckthorn (*Rhamnus alnifolia*)  
Red baneberry (*Actaea rubra*)—in berry 1949.  
White baneberry (*Actaea alba*)—in berry 1949.  
Squashberry (*Viburnum pauciflorum*)—in berry 1949.  
Labrador tea (*Ledum groenlandicum*)

\*\*Various mosses and sphagnum.

Thallus liverworts

Bunchberry (*Cornus canadensis*)—in berry 1949; in bloom 1950.

\*Small cranberry (*Vaccinium oxycoccos*)

\*Wood sorrel (*Oxalis montana*)—in bloom 1950.

\*Barren strawberry (*Waldsteinia fragaroides*)—in bloom 1950.

Arctic bramble (*Rubus borealis*)—in bloom and berry 1950.

Yellow bead lily (*Clintonia borealis*)—in bloom 1950.

Wild sarsaparilla (*Aralia nudicaulis*)—in berry 1949; just past bloom 1950.

Cinnamon fern (*Osmunda cinnamomea*)

Shining club moss (*Lycopodium lucidulum* v. *occidentale*)

Running club moss (*Lycopodium clavatum*)—adjoining dry areas.

Round-branch ground pine (*Lycopodium obscurum* v. *dendroideum*)—dry areas.

From the comments in this list it again becomes evident how much later the 1950 season was than the same period in 1949.

The birds noted in the area follow:

Horned grebe (*Colymbus auritus*)

Broad-winged hawk (*Buteo platypterus*)

Flicker (*Colaptes auratus*)

Pileated woodpecker (*Geophloeus pileatus*)—only in 1949; one seen.

Yellow-bellied sapsucker (*Sphyrapicus varius*)

Hairy woodpecker (*Dryobates villosus*)

Downy woodpecker (*Dryobates pubescens*)

Least flycatcher (*Empidonax minimus*)

Eastern wood pewee (*Myiochanes virens*)

Bluejay (*Cyanocitta cristata*)



Black-capped chickadee (*Penthestes atricapillus*)  
Tufted titmouse (*Bacolophus bicolor*)—1949 only.  
White-breasted nuthatch (*Sitta carolinensis*)—1949 only.  
Red-breasted nuthatch (*Sitta canadensis*)  
Brown creeper (*Certhia familiaris*)  
Blue-headed vireo (*Vireo solitarius*)  
Black and white warbler (*Mniotilta varia*)  
Ovenbird (*Seiurus aurocapillus*)  
Canada warblers (*Wilsonia canadensis*)  
Bronzed grackles (*Quiscalus quiscula*)  
Rose-breasted grosbeak (*Hedymeles ludovicianus*)  
Junco (*Junco hyemalis*)

The drought conditions prevailing during 1949 may account for the birds (especially the titmice) observed in this area in that year, which were not seen in 1950. In 1950, however, the breeding bird population was noticeably higher than in the previous year; for example, there were at least two pairs of rose-breasted grosbeaks in 1950 in this relatively small, trapping area. The warblers were conspicuously abundant in the latter year.

*Mammals:* In 1949, *Tamiasciuris* and *Marmota* were seen in this habitat. The former were abundant, although efforts to trap them failed. The red-squirrels were conspicuous by their absence in 1950, nor were any *Marmota* seen. Chipmunks were abundant in the dry areas surrounding the bog in both years.

In 1949 the area was trapped for six nights. Traps were placed along fallen logs, at openings of runs in the centers of boglets, under overhanging hummocks, and in runs along the scarp base. The traps were concentrated and the area was trapped in two sub-areas at two separate times. In the first area, for the first night, there were eighty-seven traps which were reduced to fifty-three for the following two nights by removing one or more from each station. Sixty-six traps were used for the last three nights in a part of the bog north of the first area, making a total for the area of 391 trap-nights. The trapping summary appears below.

One *Condylura* and one *Synaptomys* were trapped at the fault base run. Four *Clethrionomys* were taken in and around the western edges of the bog where it adjoined the white spruce-fir covered hillside. *Blarina* was found on the dry hillside next to the bog, while the long-tailed shrews (*Soricidae*) were all taken in the boglets throughout the swamp. *Peromyscus leucopus novaboracensis* was taken mainly in drier areas, while the one *Peromyscus*



*maniculatus gracilis* was taken in the wet area. A total of sixteen mammals caught meant 1 catch per 24 trap-nights.

## TRAPPING SUMMARY—1949

| Date: July                          | 5 (87) | 6 (53) | 7 | 11 (66) | 12 | 13 | Total |
|-------------------------------------|--------|--------|---|---------|----|----|-------|
| <i>Condylura c. cristata</i>        | 1      | 0      | 0 | 0       | 0  | 0  | 1     |
| <i>Sorex c. cinereus</i>            | 0      | 0      | 1 | 1       | 0  | 0  | 2     |
| <i>Sorex f. fumeus</i>              | 0      | 0      | 0 | 0       | 1  | 0  | 1     |
| <i>Sorex p. albibarbus</i>          | 1      | 0      | 0 | 0       | 0  | 0  | 1     |
| <i>Blarina b. talpoides</i>         | 0      | 0      | 1 | 0       | 1  | 0  | 2     |
| <i>Peromyscus m. gracilis</i>       | 0      | 0      | 0 | 0       | 0  | 1  | 1     |
| <i>Peromyscus l. noveboracensis</i> | 1      | 0      | 0 | 0       | 1  | 0  | 3     |
| <i>Synaptomys c. cooperi</i>        | 1      | 0      | 0 | 0       | 0  | 0  | 1     |
| <i>Clethrionomys g. gapperi</i>     | 0      | 1      | 0 | 3       | 0  | 0  | 4     |
| Total                               | 4      | 1      | 2 | 5       | 3  | 1  | 16    |

In 1950 this area was re-trapped intensively for several reasons: (1) to compare the population with last year, (2) to obtain more shrews, and (3) because of the large number of species obtained in 1949 in such a limited area and habitat. Much the same trap concentration was used as in 1949, but a somewhat wider area was covered, with more traps. Due to the standing water this year, no traps were placed in the boglet bottoms, being necessarily placed in dry spots around the edges. Traps, 101 in number, were placed across the bog, along the cliff base, and back across the bog again for two nights. For the next three nights the same number of traps were in the bog, but sixty-one of them were removed from the original sets and re-set in other areas, with about half of these being along the scarp base. For the following three nights seventy-two of the scarp and last-set bog traps (in an area similar to the conditions of last year with no standing water) were left in place, the remaining twenty-nine in the bog center having been picked up, since no mammals were caught in that area. This constituted a total of 721 trap-nights under trap concentrations and movements similar to those of 1949.

No rodents were caught in this area in 1950, and no mammals were caught in the center of the bog in areas with or without standing water. One specimen of *Microsorex*, two of *Sorex cinereus*, and one of *Sorex fumeus* were caught in the scarp-base run. One *Blarina* was caught in a dry spot at the western edge. Four of these five mammals were caught the first two nights, and the fifth (*Sorex cinereus*) three nights later. This strongly suggests that the four represented the total small mammal population of the bog, and that the fifth was an outside wanderer that came in. It seems reasonable that the water level made the difference in the loca-



tion of the shrews within the habitat in the two years. In 1949, with a wet, black muck and no standing water, the shrews were scattered over the bog, but in 1950, with abundant water, no shrews were in the center of the bog, all having been taken at the bog's eastern margin in the scarp-base run. The total catch of five mammals was the equivalent of 1 catch per 144 trap-nights.

## TRAPPING SUMMARY—1950

| Date: July                  | 3 (101) | 4 | 5 (61)<br>reset) | 6 | 7 | 8 (72) | 9 | 10 | Total |
|-----------------------------|---------|---|------------------|---|---|--------|---|----|-------|
| <i>Microsorex h. inter-</i> |         |   |                  |   |   |        |   |    |       |
| <i>vectus</i>               | 1       | 0 | 0                | 0 | 0 | 0      | 0 | 0  | 1     |
| <i>Blarina b. talpoides</i> | 1       | 0 | 0                | 0 | 0 | 0      | 0 | 0  | 1     |
| <i>Sorex c. cinereus</i>    | 0       | 1 | 0                | 0 | 1 | 0      | 0 | 0  | 2     |
| <i>Sorex f. fumeus</i>      | 0       | 1 | 0                | 0 | 0 | 0      | 0 | 0  | 1     |
| Totals                      | 2       | 2 | 0                | 0 | 1 | 0      | 0 | 0  | 5     |

IV. A dry, old field, seven miles south of Denbigh, Ontario. Elevation 1,000 feet. Trapped in only in 1949.

A dry, grassy, old field with many rocks and piles of old fence-rails surrounding a field of un-mown rye. A stone fence topped by a broken-down rail fence separates the two fields. *Polytrichum*, dry grasses (*Danthonia*), sweet fern (*Myrica asplenifolia*), and bracken (*Pteridium latiusculum*) were the dominant plants. An extensive, pure stand of white spruce surrounds the area. A pair of ravens were once seen in this area, as well as purple finches, and song and vesper sparrows.

*Mammals:* Hares (*Lepus americanus*) were frequently seen along the highway in this area, and deer (*Odocoileus*) were seen just south of the area. The rye field probably was attractive to many mammals.

Only six traps were placed in the area, for three nights. These were placed along the old stone and rail fence. Three specimens of *Peromyscus leucopus noveboracensis*, one *Microtus pennsylvanicus*, and one *Tamias striatus lysteri* were caught. One of the *Peromyscus* was captured, by the front foot only, and it remains alive and well at the present writing. This was the most productive area trapped relative to trap-nights per catch, with 1 catch per 3.6 trap-nights.

## TRAPPING SUMMARY—1949

| Date: July                          | 5 | 6 | 7 | Totals |
|-------------------------------------|---|---|---|--------|
| <i>Peromyscus l. noveboracensis</i> | 3 | 0 | 0 | 3      |
| <i>Microtus p. pennsylvanicus</i>   | 0 | 1 | 0 | 1      |
| <i>Tamias s. lysteri</i>            | 0 | 1 | 0 | 1      |
| Totals                              | 3 | 2 | 0 | 5      |



V. An open, sphagnum-*Vaccinium* bog, five miles south of Cloyne. Elevation 850 feet. Trapped in only in 1949.

This area was once a black spruce-tamarack bog but, having been cleared for a high-power line, it is now primarily an open bog with a dense mat of sphagnum supporting a heavy growth of *Vaccinium* and *Kalmia*. There are a few black spruce and tamarack seedlings in the cleared area. On either side of the clearing are stands of mature black spruces and tamaracks, while on the drier surrounding land are white spruces and firs. In 1949 this was thoroughly dried out and few spots of standing water remained; one in particular was formed by a stone and log cradle for a power-line pole. Ordinarily the entire area would be quite wet. The principal vegetation follows:

**\*\*Sphagnum**

\*Pale laurel (*Kalmia polifolia*)

\*Sheep laurel (*Kalmia angustifolia*)

\*Bog bilberry (*Vaccinium uliginosum*)

\*Small cranberry (*Vaccinium oxycoccos*)

\*Canada blueberry (*Vaccinium canadense*)

Cattails (*Typha* sp.)

Tamarack (*Larix laricina*)

Black spruce (*Picea mariana*)

Pitcher plant (*Sarracenia purpurea*)

The birds noted, principally in the black spruce-tamarack, mature stand, follow:

Kingbird (*Tyrannus tyrannus*)

Wood pewee (*Myiarchus cinerascens*)

Barn swallow (*Hirundo erythrogaster*)

Bluebird (*Sialia sialis*)

Bronzed grackles (*Quiscalus quiscula*)

Myrtle warbler (*Dendroica coronata*)

Vesper sparrow (*Poocetes gramineus*)

This type of habitat is common in low areas south of Cloyne and north of the lake-plain region.

*Mammals:* In the dried-out portion of the sphagnum bog, there were abundant old runs containing old, dried (winter or early spring) *Synaptomys* droppings and cuttings. The spruce edge sphagnum floor had similar runs with black droppings. *Lepus* runs (and forms) were abundant, criss-crossing the area, and one hare was jumped from its form in the vicinity of the cradle every time the area was visited. The wet areas con-



tained numerous runs in the sphagnum containing bright green, vole feces and fresh cuttings of grasses and mosses (*Polytrichum*). Apparently these voles had migrated to the wetter spots as the bog dried.

Fifty-three traps were set across the area so that the spruce edge, a few of the dry spots, and a large portion of the wetter areas with fresh signs, were trapped. The traps averaged about ten feet distant from each other. *Synaptomys*, and possibly *Zapus* and *Sorex*, were considered likely catches. The traps remained set out for two nights.

Two specimens of *Synaptomys cooperi cooperi* and one *Peromyscus leucopus noveboracensis* were caught the first night, comprising the entire catch, or 1 catch per 35 trap-nights.

#### TRAPPING SUMMARY—1949

|                                     |   |   |        |
|-------------------------------------|---|---|--------|
| Date: July                          | 6 | 7 | Totals |
| <i>Peromyscus l. noveboracensis</i> | 1 | 0 | 1      |
| <i>Synaptomys c. cooperi</i>        | 2 | 0 | 2      |
| Totals                              | 3 | 0 | 3      |

VI. *A small creek and a high, alder bog in the dry hills, seven miles north of Cloyne, Ontario. Elevation 1,050 feet. Trapped in part in 1949, further in 1950.*

This area includes more than the specific area trapped, and consists really of more than one type of habitat. The hill on either side of the area trapped is included in the following discussion. The hillside itself is a dry, deciduous, second growth woods with a few remaining white and red pines and some white spruces. White pines, however, comprise the great majority of the seedlings in the area, almost to the exclusion of all other types. Large-toothed and trembling aspens, white birch, and sugar maple are the dominant mature trees. The middle of the hill is traversed by a small rock-lined stream with a black mud bottom. This stream successively drains an alder marsh, a cattail-sedge marsh, another alder bog, and alternating bogs of these two types above this. These extensive bog areas lie in a flat, shallow valley between the hills. An abandoned road crosses the stream about half-way up the hill, and below the road the stream becomes much rockier and flows more rapidly. Sugar maples and herbaceous plants are much heavier along the stream than on the rest of the hill.

The plants in the general area include:

White pine (*Pinus strobus*)

Red pine (*Pinus resinosa*)



- White spruce (*Picea glauca*)
- Black spruce (*Picea mariana*)
- Balsam fir (*Abies balsamea*)
- Hemlock (*Tsuga canadensis*)
- \*Trembling aspen (*Populus tremuloides*)
- \*Large-toothed aspen (*Populus grandidentata*)
- \*Speckled alder (*Alnus incana*)
- Black willow (*Salix nigra*)
- Basswood (*Tilia americana*)
- Red osier dogwood (*Cornus stolonifera*)
- Beaked hazelnut (*Corlylus rostrata*)
- Long-beaked willow (*Salix rostrata*)
- \*Sugar maple (*Acer saccharum*)
- Red maple (*Acer rubrum*)
- Moosewood (*Acer pennsylvanicum*)
- Red oak (*Quercus borealis*)
- Sycamore (*Plantanus occidentalis*)
- Black cherry (*Prunus serotina*)
- Smooth-leaved shadbush (*Amelanchier laevis*)
- Bush honeysuckle (*Diervilla lonicera*)
- White ash (*Fraxinus americana*)
- Toothed woodfern (*Dryopteris spinulosa*)
- Cinnamon fern (*Osmunda cinnamomea*)
- Interrupted fern (*Osmunda claytonia*)
- Sensitive fern (*Onoclea sensibilis*)
- \*Sphagnum—in the bogs.
- Yellow bead lily (*Clintonia borealis*)
- \*Wool grass (*Scirpus cyperinus*)—bogs.

The birds in this area were observed rather closely, and those on the following list are all breeding birds, noted in both 1949 and 1950. At the time of the observations of 1950, fledglings and young of all varieties were abundant. The second growth, the slashings, the bare grassy areas, the low brush, and the variety of habitats apparently provided ideal breeding locations for most varieties, especially the brush-loving warblers. This area had a higher bird population than any other habitat discussed in regard to both species and individuals.

Ruffed grouse (*Bonasa umbellus*) Female and covey of young.

Woodcock (*Philohela minor*)

Whip-poor-will (*Antrostomus vociferus*)



Hummingbird (*Archilochus colubris*)—feeding on sap of white-birch from sapsucker holes.

Northern flicker (*Colaptes auratus*)

Yellow-bellied sapsucker (*Sphyrapicus varius*)

Least flycatcher (*Empidonax minimus*)

Wood pewee (*Myiochanes virens*)

Bluejays (*Cyanocitta cristata*)

Blue-capped chickadee (*Parus atricapillus*)

Winter wren (*Troglodytes hiemalis*)

Robins (*Turdus migratorius*)—abundant 1949, scarcer 1950.

Hermit thrush (*Hylocichla guttata*)

Veery (*Hylocichla fuscescens*)

Cedar waxwing (*Bombycilla cedrorum*)

Red-eyed vireo (*Vireo olivaceus*)

Black-throated blue warbler (*Dendroica caerulescens*)

Black-throated green warbler (*Dendroica virens*)

Chestnut-sided warbler (*Dendroica pensylvanica*)

Ovenbird (*Seiurus aurocapillus*)

Redstart (*Setophaga ruticilla*)

Magnolia warbler (*Dendroica magnolia*)

Nashville warbler (*Vermivora ruficapilla*)

Rose-breasted grosbeak (*Hedymeles ludovicianus*)

Indigo buntings (*Passerina cyanea*)

Purple finch (*Carpodacus purpureus*)

Goldfinch (*Spinus tristis*)

Chipping sparrow (*Spizella passerina*)

*Mammals:* Bears (*Euarctos americanus*) have been shot frequently in this area, and a barren field on the hill crest contained numerous overturned stones where a bear had been looking for ants. Tracks of minks, raccoons, deer, and foxes were seen in a muddy rut between two parts of an alder bog. The abandoned road in this area apparently provided a well-travelled animal highway. A skunk was seen walking up this road in mid-afternoon.

In 1949, fifty-five traps were set; sixteen along the creek and through an alder bog, eight through a sedge meadow in underground muddy runs, twenty-two in a dense, alder and deciduous thicket, and nine in a cattail-sedge marsh. These traps were set for two nights and yielded one *Sorex fumeus*, one *Blarina b. talpoides*, one *Peromyscus maniculatus gracilis*, and six examples of *Microtus pennsylvanicus*. The latter were



caught in both the sedge meadow and the dense, alder bog. The average catch was 1 per 12.2 trap-nights.

## TRAPPING SUMMARY—1949

| Date: July                        | 9 | 10 | Totals |
|-----------------------------------|---|----|--------|
| <i>Sorex f. fumeus</i>            | 0 | 1  | 1      |
| <i>Blarina b. talpoides</i>       | 1 | 0  | 1      |
| <i>Peromyscus m. gracilis</i>     | 1 | 0  | 1      |
| <i>Microtus p. pennsylvanicus</i> | 5 | 1  | 6      |
| Totals                            | 7 | 2  | 9      |

In 1950 twenty-nine traps were set along the same stream starting just across the abandoned road from the beginning of the line of 1949 and working downstream for about two-hundred feet. This portion of the stream had steep banks and was rockier than above. There were numerous, large boulders with many runs, crevices, and other likely places for small mammals. These traps were set for three nights and produced one *Sorex fumeus*, one *Condylura cristata*, and two of *Blarina brevicauda talpoides*, for an average of 1 catch per 22 trap-nights.

## TRAPPING SUMMARY—1950

| Date: July                   | 8 | 9 | 10 | Totals |
|------------------------------|---|---|----|--------|
| <i>Condylura c. cristata</i> | 1 | 0 | 0  | 1      |
| <i>Sorex f. fumeus</i>       | 0 | 0 | 1  | 1      |
| <i>Blarina b. talpoides</i>  | 1 | 0 | 1  | 2      |
| Totals                       | 2 | 0 | 2  | 4      |

VII. A small, sphagnum bog in a patch of spruces, 0.6 miles west of route 41 and 1.25 miles southeast of Massanoga, Ontario. Elevation 950 feet. Trapped in in 1949 only.

This is a small sphagnum bog in a patch of black spruce and firs in the center of a larger and more extensive forest of second-growth hardwoods. In many respects it is much like trapline III except that it is not as extensive or dense, and in general is an area not as cool. It was at one time burned over, as many charred stumps and logs cover the ground. The bog is divided into boglets by fallen logs, and these are covered with mosses, primarily sphagnum. Standing water persisted in some of the boglets in 1949. The outstanding feature of this habitat is its present discontinuity with the surrounding drier forest, and it is consequently an island situation.

The principal vegetation is as follows:

\*Black spruce (*Picea mariana*)

Balsam fir (*Abies balsamea*)



\*Black ash (*Fraxinus nigra*)

Red baneberry (*Actaea rubra*)

\*Sphagnum, and other mosses and liverworts.

\*Yellow bead lily (*Clintonia borealis*)

Star violet (*Dalibarda repens*)

*Mammals:* Twenty-one traps were set in this area in locations very similar to those in trapline III: in suitable runs, along fallen logs, around stump bases, and other such spots. One *Condylura cristata* and one *Microtus pennsylvanicus* were taken in two nights of trapping. This seemed like an ideal spot for *Clethrionomys* and for *Sorex*, but since none were caught, the conclusion was reached that the area was too small to support a typical bog or bog-edge fauna in an extensive dry habitat. There was one catch for each 21 trap-nights.

#### TRAPPING SUMMARY—1949

| Date: July                        | 10 | 11 | Totals |
|-----------------------------------|----|----|--------|
| <i>Condylura c. cristata</i>      | 0  | 1  | 1      |
| <i>Microtus p. pennsylvanicus</i> | 0  | 1  | 1      |
| Totals                            | 0  | 2  | 2      |

VIII. A sedge meadow and a marsh area in an old lake fill, 1.2 miles southeast of Massanoga and 1.2 miles west of route 41, on the old road to Mica. Elevation 950 feet. Trapped in only in 1949.

This is a completely open "beaver meadow" of grasses and sedges (wool grass, locally called "beaver hay"), about three-quarters of a mile long and varying from one-quarter to one-half mile wide. A small lake still remains unfilled at the western end of the area. A small, muddy, slow-flowing creek traverses the center of the area after leaving the lake. The stream is dark and very acid, as are all of the streams in this area. The wool grass is about three feet tall and forms a dense cover under which is a thick blanket of sphagnum, broken dead sedges, and other litter. Surrounding the meadow is a dense zone of speckled alders which, along with small willows, are now reaching out into the meadow area, and are thinly scattered throughout, as well as lining the central creek. These alder thickets seem to be a favorite breeding place for chestnut-sided warblers. Surrounding the alders, and on slightly higher ground, are tamaracks, white spruces, black spruces, white pines, and beyond these are mixed hardwoods in which the white birch is dominant. The vegetation of the area is listed below:



White spruce (*Picea glauca*)—edges.

Black spruce (*Picea mariana*)—edges.

Tamaracks (*Larix laricina*)—edges.

White pine (*Pinus strobus*)—edges.

\*Speckled alder (*Alnus incana*)

\*Black willow (*Salix nigra*)

White birch (*Betula papyrifera*)—edges.

\*\*Sphagnum.

\*\*Wool grass (*Scirpus cyperinus*)—"Beaver hay."

Cattails (*Typha* sp.)

Chestnut-sided warblers (*Dendroica pennsylvanica*) were breeding in large numbers in the low willow and alder bushes in the area, especially along the northern margin, where there was an extensive area of second-growth white birch and large alders and willows.

*Mammals:* Beavers were at one time plentiful in the lake at the west end of the meadow, but are now reduced by trapping to just a few. According to the report of the trapper for this area (Albert Spencer, Cloyne), they are building up again (1950) as a result of the present Ontario trapping laws. *Tamiasciurus* was plentiful in 1949, see the account under the species discussion.

Twenty-eight traps were put out at twenty-one stations about twelve feet from each other, extending in a straight line across the meadow with a few scattered on the opposite side in a patch of spruces and alders. Two of *Blarina b. talpoides*, one *Peromyscus maniculatus gracilis*, one *Peromyscus l. noveboracensis*, and one *Microtus pennsylvanicus* were caught in two nights of trapping, or 1 catch per 11.2 trap-nights.

#### TRAPPING SUMMARY—1949

| Date: July                          | 10 | 11 | Totals |
|-------------------------------------|----|----|--------|
| <i>Blarina b. talpoides</i>         | 1  | 1  | 2      |
| <i>Peromyscus m. gracilis</i>       | 0  | 1  | 1      |
| <i>Peromyscus l. noveboracensis</i> | 1  | 0  | 1      |
| <i>Microtus p. pennsylvanicus</i>   | 1  | 0  | 1      |
| Totals                              | 3  | 2  | 5      |

IX. A high, dry, barren rocky hill, 8.5 miles south of Denbigh, Ontario. Elevation 1,000 to 1,150 feet. Trapped in only in 1950.

This area represents one of the habitat types missed in 1949. The hill is a solid eminence of quartzite, and is one of the typical glaciated granitoid hills of the region. It is very steep-sided to the east, north, and south, but slopes more gradually to the west. At one time this now barren